



The Geranium Bronze butterfly (*Cacyreus marshalli*)

The Geranium Bronze butterfly (*Cacyreus marshalli*) is a native of southern Africa, and was accidentally introduced into the Balearic Island of Mallorca, Spain, probably in 1987, and since then it has spread to the other Balearic Islands and other countries in southern Europe. It spread to mainland Spain in 1993, and to the south of France in 1997. By December 2000, it had spread widely within the south of France, and has also been recorded in Italy, Belgium and Morocco. It was recorded in Malta in 2007.

Biology

The Geranium Bronze occurs on cultivated geranium (*Geranium* and *Pelargonium*) species in Europe and can pass through five to six generations per year in Mediterranean locations.

The adult butterfly is small and bronze-coloured with a wingspan of about 1.5 to 2.7 cm. The outer margin of the forewings is decorated with white dashes, and there is a white band around the edge of the hind wing. Each hind wing also has a black eyespot and a small 'tail'.



The small (0.5 mm), yellow-white eggs of the butterfly are laid on buds or on the underside of leaves. After emerging from the egg, the tiny (1 mm) larvae bore into the plant, where they feed and develop. On reaching the third instar, the larvae leave the flower bud by initiating a gallery into the stem. The larvae vary in colour between yellow and green, with stiff white hairs, and sometimes have pink markings along their body.

At 20°C (because this varies with temperature) the larvae complete their development to pupae in about 30 days and the pupal stage lasts about 17 days. The pupae gradually develop a brown mottling and are often found within plant stems, although they also occur on the ground in leaf litter.



Symptoms and detection

The damage becomes most visible during the hot season when the larvae are most active. Flower damage is the most visible symptom. Flowers can be totally eaten by the larvae. Damage can be seen on flower peduncles and is often associated with secondary damage by microorganisms which can also colonize the tissue around the entry hole of the larvae into the peduncles. Leaves may be partially eaten by the larvae but this symptom is less frequent and can be confused with feeding by snails.

Eggs can be found at the level of flower buds, and less frequently on leaves. Caterpillars are found in flower buds or where they bore into the stem. Entrance holes in buds and stems are easy to detect. Once attacked, the stems become blackish. Others species of Lepidoptera developing on *Geraniaceae* do not mine in stems.

Dispersal

The potential for natural spread is very low. The flight is short in duration, leisurely and interspersed with frequent rests. The most likely means of international dispersal is the movement of infested plant material, since larvae cannot easily be detected because of their habitat within the stem.

Control

Examine rooted geranium cuttings when they are brought. Techniques such as propagation via stem cuttings, removal of damaged tissue, deadheading, pinching out of growing-tips and pruning - present opportunities to examine plants for signs of infestation. Parts which are infected should be eliminated and treated with insecticides.

Plant protection products such as *Bacillus thuringiensis* and diflubenzuron are efficient insecticides for the control of *C. marshalli*.

The pest has potential to establish in the Mediterranean basin and can be considered as a real danger for the European mainland. In Malta we are at a great risk since our climatic conditions would allow the pest to over-winter outdoors.

While the pest has a very restricted distribution in Europe, great vigilance is needed to prevent its establishment in new areas. Planting material should be obtained from areas free from the pest. If *C. marshalli* enters and establishes in an area, it may be very difficult to ensure that nurseries producing pelargonium planting material can be certified free from the pest.

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